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greater facility in avoiding her. If, for example, a vessel on her course descries a-head two steadily revolving lights, one of which is white and the other green, it is evident that a steam-boat is in that place, and going in the same direction as the other vessel; but if both the lights are white, it is plain that the steam-boat is bearing down, and that due care must be taken to avoid her. The same advantage might also be obtained by causing the lights of every steam-boat to revolve in one and the same direction.

The shock of any two sailing vessels falling aboard of each other at sea will not unfrequently sink the smaller one; and the probable mischief to be apprehended from two steam-boats in similar circumstances is greatly increased both by the greater velocity of the vessels, and the weakness of their construction.

XVIII.—SELF-ILLUMINATING CLOCK.

The LARGE SILVER MEDAL *was this Session presented to Mr.* J. P. PAINE, 39, *High-street, Bloomsbury, for his mode of* ILLUMINATING PUBLIC CLOCKS, *a Model of which has been placed in the Society's Repository.*

39, High-street, Bloomsbury,
April 8, 1827.

SIR;

THE model I have this day the honour to exhibit to your consideration has long occupied my closest attention, as I consider there is no object to which mechanism is applied of more importance than our public time-keepers, and which I lament have by no means kept pace with the improvements introduced into other branches of the arts.

It is true the hands continue to perform their revolu-

tions; but for six months of the year they are nearly half their time useless; and even for the remainder, we lose their service during one third of the time. To remedy this defect is the object of my invention, in effecting which I have endeavoured to combine utility, elegance of appearance, durability of material, simplicity of operation, and economy.

The model is made to the quarter size of a six-feet dial, the average size for churches. It may be termed a skeleton dial, the usual blank spaces being perforated, and the hours and minutes left in the solid, in the exact situation in which they are placed in a well painted dial, in Roman characters. The material is of cast-iron, and in the full size will be about five eighths of an inch thick; the spaces are filled in with coloured glass, and the light so diffused from the inside, that not only the hour, but even the minutes, may be distinctly seen by night; and during the day the deep colour of the glass will give the clock face a dark appearance; this is not to be obtained by using common ground glass, which shows white, and looks poor with only a black letter painted on it.

The model also exhibits a plan which, by the revolution of the motion of the hands, with the addition of only one wheel and pinion, lights up the dial itself, and extinguishes the same at any period of time that may be necessary, and by simply withdrawing or adding a pin once a month, according as the days increase or decrease in length, it will vary its time of operation accordingly; so that whether it is required to be lighted at four o'clock in the afternoon, and to burn till eight in the morning, or not to light up till nine at night, and to be put out at three, as in the longest and shortest day, it is always punctual in its operation at the given period. I trust the simplicity of the means by which this is effected will meet your approbation. The dial being made of framed

work, allows of its being glazed with small pieces, and therefore, if broken, of being restored at a trifling expense; the joints of the glass are behind the letters, and thus any indistinctness which might otherwise be occasioned by them is avoided. I shall be happy to exhibit the model in full operation before the committee, at any time that they may appoint.

I am, Sir,

A. Aikin, Esq. &c. &c. &c.

Secretary, &c. &c. J. P. PAINE.

Mr. Paine's object is to render the dial of a church or other turret-clock visible by night, and also to obviate the necessity of a person going twice every day up to the clock for the purpose of lighting and extinguishing the jet. During the day no more gas is expended than is sufficient to keep up the smallest possible flame, and during the night the flame is large enough to answer the intended purpose. The actual consumption of gas in the clock of St. Giles's church, fitted up by Mr. Paine himself, is fourteen cubic feet during the day, and fifty-six cubic feet during the night.

Certificates were produced from the parish officers of St. Giles's, highly approving Mr. Paine's plan; and at the last meeting of the committee on the subject, on the 21st of May, it appeared that the jet had continued constantly alight for a month.

The illumination of public clocks is practised with more or less success in various places. At Glasgow the jet is on the outside of the dial-plate: and at Manchester the mode of illumination from within has been for some years adopted; the light, however, is not regulated by the motion of the clock, as in Mr. Paine's dial, but the jet is lighted and extinguished by hand like other gas-lamps.

Reference to the Engraving.—Plate VIII.

Fig. 1 represents a skeleton frame dial, cast all in one piece; the eight central divisions are very thin, and curved, so as not to coincide or interfere with the hands while passing over them; the spaces are all filled up with transparent red glass, ground rough on the inside; this by day is sufficiently dark to relieve and render distinctly visible the gilt hour numbers; but at night when the gas-burners behind the dial-plate are lighted up, the hours, minutes, and hands appear black, and the rest of the dial glows with a dusky red light.

Fig. 2 is a horizontal section across the aperture *a a* in the church tower at the back of the dial *b b*; *c* the tube which carries the hour hand, having a balance weight and the wheel 48 on its inner end; through this passes the shaft *d d*, holding at one end the minute hand, and at the other end the pinion 14, and balance-weight *e*; *f f* two gas burners; *g g* the tubes supplying the gas—they branch from the upright tube *h h*, fig. 3; the aperture *a a*, not being as large as the dial, is chamfered off at *i i*, to give a clear passage from the lights all over the dial; *j j* a curved reflector, made of sheets of tin; *k k* a bar crossing the aperture *a a* within to support the motion wheels and the additional twenty-four-hour wheel 96; the long axis *d d* receives motion from the clock, as usual, by a bevel wheel; 14, 42, 12, and 48, fig. 5, are the usual motion wheels and pinions; an additional pinion of 12 is put on the wheel 42 to turn the wheel 96, this has thirteen pins, one hour's motion apart; these pins have raised up the weighted lever *l* in fig. 3, and are near letting it drop; while this is up, its opposite end *m*, by means of the connecting rod *n*, keeps the lever handle *o* of the gas cock *p* down, and thus nearly closes it, allowing the pas-

sage of only just enough gas to keep the burners alight; but at eight o'clock, when the weight *l* drops, it raises the handle *o*, and quite opens the cock *p*, by which the dial is instantly illuminated. It will be seen by the dotted place of the lever *l*, fig. 3, that there are seven hours before the first pin will touch it, and two hours more will quite raise the lever, slowly closing the cock *p* as at first, where it will remain till all the pins have passed the lever.

Fig. 4 represents the lever *l* down, and the pins nearly beginning to raise it; by removing two pins, one at each end, the clock will open the gas-cock one hour sooner, and nearly close it one hour later. By successively removing the pins as the days shorten, and replacing them as the days lengthen, the clock is accommodated to all seasons.

Fig. 4 shows the wheels arranged in one line on one bar *k k;* fig. 5 is a top view of them. The whole space is kept clear between the lights and the dial, except only the axis *c*, fig. 2; and the lights being placed on each side of this, and having a large reflector, no shadow is perceived from it.

XIX.—IMPROVED LATHE CHUCK.

The LARGE SILVER MEDAL *was this Session given to Mr.* J. BOWER, *of Clerkenwell-green, for his* IMPROVED LATHE CHUCK, *for Engine-turners, a Model of which has been placed in the Society's Repository.*

SIR; May 9, 1827.

I BEG leave to submit, for the consideration of the Society of Arts, the accompanying lathe-chuck, the object of which is to *turn*, if so it may be called, a straight